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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/805,163	03/14/2001	Masaru Osada	0378-0381P	1759

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EXAMINER

YODER III, CHRISS S

ART UNIT PAPER NUMBER

2612

DATE MAILED: 01/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/805,163	<b>Applicant(s)</b> OSADA ET AL.	
	<b>Examiner</b> Chriss S. Yoder, III	<b>Art Unit</b> 2612	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 November 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-83 is/are pending in the application.  
     4a) Of the above claim(s) See Continuation Sheet is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 3 and 8 is/are rejected.
- 7) ☒ Claim(s) 13, 18, 23, 28, 33, 38, 43, 48, 53, 58, 63 and 68 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>3/01 and 11/05</u> . | 6) <input type="checkbox"/> Other: _____  |

Continuation of Disposition of Claims: Claims withdrawn from consideration are 4-7,9-12,14-17,19-22,24-27,29-32,34-37,39-42,44-47,49-52,54-57,59-62,64-67 and 69-83.

## DETAILED ACTION

### *Response to Arguments*

Applicant's arguments filed November 4, 2005 have been fully considered but they are not persuasive.

Applicant argues, with respect to claim 1, that Acharya does not obtain position data for virtual pixels in one mode and three primary colors of the virtual pixels in a second mode, and the use of a signal processing circuit for interpolating in a first mode, designated by said operation commanding circuit, pixel data in positions of said virtual pixels or positions of said photosensitive cells and generating three primary color data on the basis of a plurality of pixel data, which are produced by mixing pixel data, or interpolating, in a second mode designated by said operation commanding circuit, three primary color image data in the positions of said virtual pixels on the basis pixel data sequentially read out of said photosensitive cells, generating three primary color pixel data at the positions of said photosensitive cells on the basis of said pixel data given to said virtual pixels, and broadening a frequency band of said three primary color image data. However, the claim is written in the alternative (using the word "or") as seen here:

"a signal processing circuit for interpolating, in a first mode designated by said operation commanding circuit, pixel data in positions of said virtual pixels or positions of said photosensitive cells and generating three primary color data on the basis of a plurality of pixel data, which are produced by mixing pixel data, or interpolating, in a second mode designated by said operation commanding circuit, three primary color image data in the positions of said virtual pixels on the basis pixel data sequentially read out of said photosensitive cells, generating three primary color pixel data at the positions of said photosensitive cells on the basis of said pixel data given to said virtual pixels, and broadening a frequency band of said three primary color image data"

and therefore, can be interpreted as either one "or" the other, and has been interpreted and examined as such. The examiner's interpretation can be seen here:

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a signal processing circuit for interpolating, in a first mode designated by said operation commanding circuit, pixel data in positions of said photosensitive cells and generating three primary color data on the basis of a plurality of pixel data, which are produced by mixing pixel data, and broadening a frequency band of said three primary color image data

Therefore, the Acharya reference does meet these limitations as interpreted by the examiner.

Applicant also argues that Higuchi does not teach or suggest an arrangement of electrodes that skirts around apertures. The Examiner points out that Higuchi does in fact teach an arrangement of electrodes that skirt around apertures in the column 5, lines 7-13 and in figure 1: 16 (each box formed of a dotted line is the electrode formed to "skirt" around the aperture).

Applicant also argues that Nishizawa does not teach how to position the signals that are generated. The Examiner would like to point out that the only limitation in the claims that addresses the positioning of generated signals is in the second mode listed in claim 1:

"in a second mode designated by said operation commanding circuit, three primary color image data in the positions of said virtual pixels on the basis pixel data sequentially read out of said photosensitive cells, generating three primary color pixel data at the positions of said photosensitive cells"

this limitation was written in the alternative (a first or second mode) and only one mode is necessary to meet the limitations of the claim. Therefore, the examiner has interpreted this claim using the first mode, in which the positioning of generated signals is not present.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Acharya (US Patent # 6,366,694) in view of Higuchi (US Patent # 6,271,005).
2. In regard to claim 1, note Acharya discloses the use of an image pickup section comprising color filter comprising color filter segments for separating light incident via the apertures into a plurality of colors each having a particular spectral characteristic, wherein said color filter segments include color filter segments having complementary color spectral characteristics (column 4, lines 10-15; each pixel is specific color based on the filter), an image sensing section comprising photosensitive cells for converting the light transmitted through said color filter segments to electric signals, wherein nearby ones of said photosensitive cells are shifted from each other in at least one of a vertical and a horizontal direction in a bidimensional arrangement (column 4, lines 10-15; the pixels are arranged in a horizontal and vertical array pattern, and each pixel outputs an image signal value), an operation commanding circuit for outputting a timing and any one of a plurality of modes for reading the signals out of said image pickup section (column 4, lines 45-50), a digitizing circuit for converting the signals read out of said image pickup section to digital data (column 3, lines 30-37; although it is not explicitly disclosed that the signal read out is digitized, this step is inherent based on the

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use of a digital camera), wherein said digital data are arranged in a plane that contains said photosensitive cells and virtual pixels derived from a shifted arrangement of said photosensitive cells (column 4, lines 20-40; the 8-bit pattern shown in fig. 1a is considered the photosensitive cells, and the 24-bit pattern is considered to be the virtual pixels), and a signal processing circuit for interpolating, in a first mode designated by said operation commanding circuit, pixel data in positions of said photosensitive cells and generating three primary color data on the basis of a plurality of pixel data, which are produced by mixing pixel data (column 4, lines 20-40; the 8-bit pattern shown in fig. 1a is considered the photosensitive cells, and the 24-bit pattern is considered to be the virtual pixels), and broaden a frequency band of said three primary color image data (by creating three colors for each pixel, the frequency band of each pixel is increased).

Therefore, it can be seen that the Acharya device lacks the use of electrodes arranged in such a manner as to skirt round the apertures for producing signals from said photosensitive cells and transfer registers each for sequentially transferring the signals input via said electrodes in a vertical direction or a horizontal direction. Higuchi discloses the use of electrodes arranged in such a manner as to skirt round the apertures for producing signals from said photosensitive cells (column 5, lines 7-13 and in figure 1: 16 - each box formed of a dotted line is the electrode formed to "skirt" around the aperture) and transfer registers each for sequentially transferring the signals input via said electrodes in a vertical direction or a horizontal direction (figure 1: 13; column 4, lines 9-11). Higuchi teaches that the use of electrodes arranged in such a manner as to skirt round the apertures for producing signals from said photosensitive cells and

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transfer registers each for sequentially transferring the signals input via said electrodes in a vertical direction or a horizontal direction is preferred in order to increase the sensitivity and degree of integration as well as to further miniaturize the sensor (column 4, lines 45-46). Therefore, it would have been obvious to one of ordinary skill in the art to modify the Acharya device to include the use of electrodes arranged in such a manner as to skirt round the apertures for producing signals from said photosensitive cells and transfer registers each for sequentially transferring the signals input via said electrodes in a vertical direction or a horizontal direction as suggested by Higuchi.

3. Claims 2-3 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Acharya (US Patent # 6,366,694) in view of Higuchi (US Patent # 6,271,005) and further in view of Nishizawa et al. (US Patent # 4,516,154).

4. In regard to claim 2, note Acharya discloses that the apertures have a tetragonal or a polygonal shape (figure 1; each pixel is square/rectangular). Therefore, it can be seen that the primary reference of Acharya in view of Higuchi fails to disclose that the apertures are arranged bidimensionally by being shifted from each other by one-half of the pixel pitch in the vertical direction column by column or in the horizontal direction row by row. Nishizawa discloses the use of apertures which are arranged bidimensionally by being shifted from each other by one-half of the pixel pitch in the vertical direction column by column or in the horizontal direction row by row (figure 2). Nishizawa teaches that the use of apertures which are arranged bidimensionally by being shifted from each other by one-half of the pixel pitch in the vertical direction column by column or in the horizontal direction row by row is preferred in order to



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suppress the generation of Moiré and high quality pictures can be reproduced (column 4, lines 11-12). Therefore, it would have been obvious to one of ordinary skill in the art to modify the primary device to include the use of apertures which are arranged bidimensionally by being shifted from each other by one-half of the pixel pitch in the vertical direction column by column or in the horizontal direction row by row as suggested by Nishizawa.

5. In regard to claim 3, note Nishizawa discloses that the color filter segments use a plurality of colors selected from cyan (Cy), magenta (Mg), yellow (Ye), white (W) and green (G) derived from subtractive mixture (column 2, lines 62-67), wherein a first color is arranged in a tetragonal lattice pattern with the nearby photosensitive cells being shifted from each other by one-half of the pixel pitch, and wherein a second and a third color are arranged in either one of a checker pattern and a full-checker pattern while being shifted from said tetragonal lattice pattern by one-half of the pixel pitch (figure 2).

6. In regard to claim 8, note Nishizawa discloses the use of that the image pickup section performs, in the first mode, interlace scanning to thereby read out signal charges of a same field while mixing pixels or sequentially reads out, in the second mode, all signal pixels (column 3, lines 48-52).

### ***Allowable Subject Matter***

Claims 13, 18, 23, 28, 33, 38, 43, 48, 53, 58, 63, and 68 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in

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independent form including all of the limitations of the base claim and any intervening claims.

As for claims 13, the prior art does not teach or fairly suggest the use of an image processing circuit that interpolates an image and raises a frequency band of the pixel data output from the interpolation, then generates luminance and chrominance signals, and removes the aliasing distortion.

As for claims 48, the prior art does not teach or fairly suggest the use of an image processing circuit that interpolates an image signal and the use of a broadband circuit, that by using a quasi-frequency adding circuit, that band-by-band adds a component signal, giving priority to color resolution, and preventing overlap in bands.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chriss S. Yoder, III whose telephone number is (571) 272-7323. The examiner can normally be reached on M-F: 8 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ngoc-Yen Vu can be reached on (571) 272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CSY  
January 11, 2005

  
NGOC-YEN VU  
PRIMARY EXAMINER